

4.1.6 Asbestos

Phase I - Investigation

During drilling activities associated with Phase I, identification of serpentine was made by the on-site geologist. The presence of serpentine prompted concern for potential airborne asbestos to be released during future soil excavation. Therefore, GRC, along with SFDPW, made the determination to analyze suspect samples of serpentine during the subsequent Phase II investigation.

Phase II - Investigation

Two soil samples collected at the M&M property during the Phase II investigation were suspected of containing serpentine and were submitted for PLM analysis. Samples P-5 (5.5') and P-7 (4.0') revealed concentrations of asbestos (as chrysotile) ranging from 1 to 5 percent (%) (85% granular minerals, 15% Mica) and 2 to 5% (80% granular minerals, 10% Mica), respectively (by weight; See Tables 9A and 9B, Appendix E). These concentrations equalled or exceeded the Title 26 TTLC value of 1 percent asbestos. The percentage of asbestos in soil is the portion of the homogenized soil sample which is subjectively identified as asbestos, when analyzed by PLM. The sample is viewed under a polarized light microscope, and percent in this case is a function of the sample mass.

An EPA-funded study (Floyd, 1989) concluded that 1 percent asbestos in soil, subjected to mechanical disturbances, is a sufficient concentration to generate 0.1 asbestos structures per cubic centimeter of air which is the National Institute for Occupational Safety and Health (NIOSH) limit for airborne asbestos.

4.2 GROUNDWATER SAMPLING RESULTS

Phase I Investigation

During the Phase I investigation, groundwater samples were collected from B3 and from an existing well (MW1) at the Unocal station at Phelps Avenue and Evans Street. Results from the Phase I groundwater investigation are included in Tables 6 and 7.

Phase II Investigation

During Phase II, a total of three HydroPunch groundwater samples were collected at the M&M property. At the request of the SFDPH, the HydroPunch samples were collected in the same location as the respective soil borings P-3, P-5 and P-7. Results from the Phase II groundwater investigation are included in Tables 13 and 14, Appendix G.

4.2.1 Metals

Phase I Investigation

Title 26 metal results indicate the presence of arsenic, barium, chromium (total), cobalt, copper, lead, mercury, nickel, vanadium and zinc above laboratory detection limits in the groundwater samples collected from B3 and/or MW1 (See Table 7). In addition, lead was detected at 3.3 mg/l in B3 which exceeds the 3.0 mg/l local sewer discharge limits for the City and County of San Francisco (See Table 7). Antimony, beryllium, cadmium, molybdenum, selenium, silver and thallium were not present above laboratory detection limits in the groundwater samples collected from B3 and MW1.

Phase II Investigation

Title 26 metal results indicate the presence of lead and zinc above local sewer discharge limits in the HydroPunch groundwater samples during Phase II (See Table 14).

Lead was detected in P-3W at a concentration of 3.2 mg/l, which exceeds the local sewer discharge limit for lead (3.0 mg/l) for the City and County of San Francisco (BWPC 1990).

Sample P-5W was the first groundwater sample collected during the Phase II investigation, and GRC followed the recommended HydroPunch sampling procedures. However, as discussed in Section 2.2, Bay Mud was encountered at approximately 11 feet below ground surface, which retarded ground water inflow into the HydroPunch, and precluded the collection of a sufficient groundwater sample at P-5W. In order to collect a sample at P-5W, GRC removed the HydroPunch from inside the hollow-stem auger, and sampled the ground water by dropping a Teflon bailer directly through the auger flights.

The sampling methodology for P-5W deviated from that employed for P-3W and P-7W, which resulted in the collection of a highly turbid sample. P-3W and P-7W were collected with the HydroPunch within the more permeable soil layer that existed above the Bay Mud. Due to the excessive amount of suspended, insoluble material in sample P-5W, AEL filtered the sample prior to sample preparation and the results listed in Table 14 reflect filtered ground water. In accordance with the EPA publication Test Methods For Evaluating Solid Waste (SW-846), sample filtration (or centrifuging) is typically completed as a final step in the preparation process prior to analysis by EPA Method 6010.

Sample P-5W (filtered) contained 0.25 mg/l lead and 0.20 mg/l zinc which do not exceed the local sewer discharge limits of 3.0 mg/l and 7.0 mg/l, respectively.

Sample P-7W (unfiltered) revealed concentrations of lead (10 mg/l) and zinc (8 mg/l) which exceeded the local sewer discharge limits of 3.0 mg/l and 7.0 mg/l, respectively.

Due to slow groundwater recharge, GRC was unable to collect enough ground water to submit a "blind" duplicate sample.

4.2.2 Total Petroleum Hydrocarbons - Gasoline and Diesel

Phase I and II Investigation

Total petroleum hydrocarbons (TPH) as gasoline or diesel were not present above laboratory detection limits in any of the groundwater samples submitted for testing for either Phase I or Phase II (See Tables 6 and 13). Analyses for oil and grease in ground water were not conducted in either of the Phase I or Phase II investigations.

4.2.3 Volatile Organics and Semi-Volatile Organics

Phase I Investigation

Volatile and semi-volatile organics, analyzed in accordance with EPA Methods 624 and 625, were not present above laboratory detection limits in any of the groundwater samples submitted for testing during the Phase I investigation (See Table 6).

Phase II Investigation

Purgeable aromatics (EPA Method 602) and purgeable halocarbons (EPA Method 601), were not present above laboratory detection limits in any of the groundwater samples submitted for testing during the Phase II investigation (See Table 13).

4.2.4 Cyanides, Sulfides

Phase I Investigation

Neither cyanides nor sulfides were present above laboratory detection limits in the groundwater samples submitted for analyses for the Phase I investigation (See Table 6). For this reason, analyses of these parameters in ground water were not conducted for the Phase II investigation.

4.2.5 Acidity and Flammability

Phase I Investigation

The pH of groundwater samples submitted for laboratory analyses was measured at 7.0 for both B3 and MW1. The pH of groundwater samples monitored in the field were measured between 7.2 and 7.4 at B3 and 6.9 to 7.3 at MW1 (See Table 6). These data indicate that field measurements are consistent with measurements obtained by the laboratory.

Neither pH nor flammability characterization was conducted for the Phase II investigations.

4.2.6 Chlorides, Salinity and Specific Conductance

During the Phase II investigation, groundwater samples were submitted for chlorides (EPA Method 9252), salinity (EPA Method 2520) and specific conductance (EPA Method 9050) to determine the potential potability of ground water. Chloride was found to range from 2,200 mg/l to 5,400 mg/l, salinity was found to range from 4,000 mg/kg to 9,700 mg/kg and specific conductance ranged from 9,800 to 25,000 micromhos per centimeter in samples P-3, P-5 and P-7 (See Table 13). Secondary Maximum Contaminant Levels (MCLs) for chlorides and salinity are 250 mg/l and 500 mg/l, respectively. Based on the chloride, salinity and specific conductance analyses performed, ground water at Islais Creek is not of potable quality.

4.3 GENERAL SUBSURFACE SITE CONDITIONS

This section presents an overview of the Phase I subsurface site conditions, and describes the subsurface conditions encountered during drilling of the Phase II investigation. Cross sections A-A', B-B', and C-C' (See Figure 3) were generated based on the boring logs, presented in Appendix H.

The Phase I subsurface investigation conducted in the general vicinity of the M&M property and on Davidson Avenue revealed artificial fill ranging from 9 to 16 feet in thickness. The fill consists of sands and gravels with minor percentages of silt and clay. Debris and organic materials were also encountered in the fill. Soft Bay Mud was encountered below the fill.

The Phase II study area is covered with asphalt or loose gravel with local areas of concrete on the M&M property. The M&M property generally consisted of an 11 to 13-foot-thick artificial fill layer with varying percentages of sands and gravels with gravelly clay and silty gravel layers noted in borings P-4 and P-5. Debris such as concrete, brick, porcelain tile, and glass were encountered within the fill. Bay Mud underlies the artificial fill at 11 to 13 feet. The Bay Mud consists of soft

clay to silty clay with shells and other organic debris and may extend to approximately 60 to 70 feet in depth (GRC, August 1990).

An approximately 8 to 9-foot-thick layer of artificial fill consisting of sandy gravel to gravelly sand underlies Davidson Avenue in the area of B10. An approximately 3-foot-thick gravelly clay lense is present at boring P-2 below the sandy gravel layer at 8 feet below ground surface. Bay Mud, consisting of soft clay to silty clay, with shells and other organic debris, underlies the artificial fill along Davidson Avenue. Carbonaceous debris was noted in boring P-1 within the artificial fill, however, photoionization detector (HnU) readings at this location were not detected.

During drilling, ground water was generally encountered between 7 and 9 feet below the ground surface (See Appendix H, Figure 3). However, water level measurements recorded at the time of drilling are generally inaccurate due to the presence of soils smeared along the borehole walls. Accurate water level measurements may only be obtained in cased monitoring wells that are developed and allowed to reach equilibrium. Groundwater levels measured in borings at the site did not rise significantly during drilling, suggesting that ground water at the both the M&M property and in the vicinity of B10 is unconfined and represents water table conditions, or, that clayey soils may have prevented water from rapidly entering the borehole.

5.0 CONCLUSIONS

This section presents summaries of the soil and groundwater conditions encountered during the Phase I and Phase II investigations. A comparison, based on the chemical data, is presented below and in Figure 4 for the AC Auto and M&M properties. The results of the soil analyses for the boreholes located bayward of the high-tide line (as per Article 20) for both the Phase I and Phase II Islais Creek Project Site Investigations are, in GRC's judgement, representative of the proposed excavation site conditions.

Drums containing soil cuttings, groundwater development water and decontamination water from both Phase I and Phase II investigations are currently stored at the Bureau of Water Pollution Control's Southeast Wastewater Pollution Control Plant (Appendix I).

5.1 SOIL AND GROUND WATER

5.1.1 Phase I Investigation

Analytical results for the soil and groundwater samples collected and analyzed during the Phase I field investigation, conducted in March 1990, are summarized as follows:

- a. Soil in the area of B1, B2, B3, B4, B5, B8, B10 and B13 may be considered hazardous based on the TTLC and STLC values for lead, copper and/or zinc (See GRC, August 1990 for boring locations).

- b. Soil does not appear to be hazardous based on the analyses of the following compounds and characteristics:
 - o TPH as gasoline.
 - o PCB, cyanides or sulfides.
 - o Corrosivity and flammability characteristics.
- c. Ground water in the area of B3 (sample unfiltered) exceeded BWPC lead limits for local sewer discharge limits.

Based on historical land usage, pesticides were not suspected, and thus, not tested for during the Phase I Investigation at the Islais Creek Pump Station site.

5.1.2 Phase II Investigation

Soil and groundwater samples collected and analyzed during the Phase II investigation, conducted in September 1990, are summarized as follows:

- a. Soil in the area of P-1, P-2 and P-3 may be hazardous based on the STLC values for lead, and in the area of P-3, P-4, P-5, P-6 and P-7, based on TTLC values for cadmium, lead and nickel. Also, asbestos was detected at concentrations above the Title 26 limit of 1 percent in P-5 (5.5') and P-7 (4.0'). However, the percentage of asbestos in soil is the portion of the homogenized soil sample which is subjectively identified as asbestos, when analyzed by PLM.
- b. Soil does not appear to be hazardous based on the analyses of the following compounds and characteristics:
 - o TPH as gasoline.
 - o PCBs, cyanides, and sulfides.
 - o Corrosivity, reactivity and flammability characteristics.

- c. Ground water in the area of P-3 and P-7 (samples unfiltered) exceeded BWPC limits for lead for local sewer discharge limits.
- d. Ground water is not potable based on the following analyses:
 - o Chloride, salinity and specific conductance.

Based on historical land usage, pesticides were not suspected, and thus, not tested for during the Phase II Investigation at the Islais Creek Pump Station site.

5.1.3 Comparison of the AC and M&M Properties

The list below provides a comparison of the AC and M&M properties based on soil and groundwater constituents that exceed or equal regulatory limits and/or guidelines:

Constituents in Soil

AC Auto Wreckers

B-2 Composite

Soluble Lead = 140 mg/l

B-2 (3.0')

Soluble Lead = 15 mg/l

B-3 Composite

Total Lead = 5,400 mg/kg

Soluble Lead = 160 mg/l

M&M Auto Wreckers

P-3 (1.5')

Soluble Lead = 51 mg/l

Total Nickel = 200 mg/kg
($<10 \times$ STLC)

P-3 (8.5')

Soluble Lead = 43 mg/l

Total Cadmium = 11 mg/kg
($<10 \times$ STLC)

Total Nickel = 320 mg/kg
($<10 \times$ STLC)

P-4 (1.5')

Soluble Lead = 8.1 mg/l

Total Nickel = 470 mg/kg
($<10 \times$ STLC)

AC Auto Wreckers

B-3 (7.5')

Total Lead = 3,400 mg/kg
Soluble Lead = 230 mg/l
Soluble Copper = 60 mg/l

B-4 Composite

Total Lead = 2,500 mg/kg
Soluble Lead = 18 mg/l

B-4 (3.5')

Total Lead = 1,500 mg/kg
Soluble Lead = 64 mg/l

B-4 (8.5')

Total Lead = 2,500 mg/kg
Soluble Lead = 160 mg/l
Soluble Copper = 310 mg/l

B-5 Composite

Total Lead = 2,100 mg/kg
Soluble Lead = 130 mg/l

B-5 (4.5')

Soluble Lead = 7.0 mg/l

B-5 (8.5')

Total Lead = 3,700 mg/kg
Soluble Lead = 72 mg/l
Total Zinc = 6,400 mg/kg
Soluble Zinc = 260 mg/l
Soluble Copper = 41 mg/l

M&M Auto Wreckers

P-4 (8.5' & 13' Composite)

Total Nickel = 560 mg/kg
($<10 \times$ STLC)
Total Cadmium = 21 mg/kg
($<10 \times$ STLC)

P-5 (5.5')

Asbestos = 1-5% (as Chrysotile)

P-5 (8.5' & 12' Composite)

Total Nickel = 480 mg/kg
($<10 \times$ STLC)

P-6 Composite

Total Lead = 3,500 mg/kg
Soluble Lead = 62 mg/l
Total Nickel = 530 mg/kg
($<10 \times$ STLC)

P-7 (4.0')

Asbestos = 2-5%
(as Chrysotile)

P-7 (8.5')

Total Nickel = 1,300 mg/kg
($<10 \times$ STLC)

Constituents in Ground Water

AC Auto Wreckers

B-3 (unfiltered)
Total Lead = 3.3 mg/l

M&M Auto Wreckers

P-3W (unfiltered)
Total Lead = 3.2 mg/l

P-7W (unfiltered)
Total Lead = 10 mg/l
Total Zinc = 8.0 mg/l

5.1.4 Soil and Groundwater Constituents Identified Outside the
AC and M&M Properties During the Phase I and Phase II
Investigations

The list below provides the remainder of the Phase I soil constituents detected outside of the AC property that exceed or equal regulatory limits and/or guidelines:

Davidson Avenue

B-1 Composite
Soluble Lead = 26 mg/l

B-1 (4.2')
Soluble Lead = 12 mg/l

B-1 (8.0')
Total Lead = 1,100 mg/kg
Soluble Lead = 200 mg/l

Custer Avenue/Third Street

B-8 Composite
Soluble Lead = 5.1 mg/l

Davidson Avenue/Phelps Street

B-10 Composite

Total Lead = 2,800 mg/kg and
1,500 mg/kg (second analysis)
Soluble Lead = 46 mg/l
Soluble Copper = 27 mg/l

Southeast Water Pollution Control Plant

B-13 Composite

Soluble Lead = 11 mg/l

The list below provides the remainder of the Phase II soil constituents collected outside of the M&M property that exceed or equal regulatory limits and/or guidelines:

Davidson Avenue (75' Northwest of B-10)

P-1 (5.0')

Soluble Lead = 8.0 mg/l

P-1 (9.0')

Total Lead = 3,000 mg/kg
Soluble Lead = 97 mg/l

Davidson Avenue (65' South of B-10)

P-2 (11.5')

Soluble Lead = 49 mg/l

Detection of asbestos (as Chrysotile) in soil at the M&M property suggests that serpentine may exist in isolated locations throughout the M&M site. Soil exceeding this Title 26 TTLC limit may require disposal at a landfill that practices encapsulation. Serpentine was not identified in the soil cuttings from the AC property, therefore, soil samples collected during the Phase I investigation were not analyzed for asbestos.

Soil samples analyzed from both the AC and M&M properties revealed concentration of metals in soil that exceeded STLC and TTLC values. Additionally, concentrations of metals in soil samples analyzed from the AC Auto Wreckers site in general revealed a wider range of metals, and higher total (TTLC) and soluble (STLC) values than did the samples analyzed from the M&M property.

Unfiltered groundwater samples analyzed from both the AC and M&M properties revealed concentration of lead in ground water that exceeded the BWPC local sewer discharge limits. In addition to lead, zinc was also detected in the unfiltered groundwater samples analyzed from the M&M property.

Based on past experience and knowledge of the industry, disposal of hazardous aqueous and/or liquid waste is logistically and economically more restrictive than disposal of hazardous solid/soil wastes. However, precipitation/recovery of metals in liquid waste is an existing technology available within EPA Region IX (California, Nevada and Arizona). Based solely on the analytical data obtained from the Phase I and Phase II Investigations, the soil at the M&M property appears to have been less impacted by contaminants than the soil at the AC property.

6.0 REFERENCES

- Bonilla, M.G., 1971, "Preliminary Geologic Map of the San Francisco South Quadrangle and Part of the Hunters Point Quadrangle, California", U.S. Geological Survey, Misc. Field Studies Map MF-311.
- California Department of Health Services, December, 1986, "California Site Mitigation Decision Tree", Sacramento, California.
- California Department of Health Services, July, 1990, Memorandum from C. Woodhouse regarding "Total Petroleum Hydrocarbons", Sacramento, California.
- Floyd, G.A., 1989, "Environmental Asbestos: A Correlation of Percentages in Soil With Concentrations in Air." unpublished M.S. Thesis, Gleeson Library, University of San Francisco. San Francisco, California.
- Geo/Resource Consultants, Inc., December, 1989. "Site History Review - Islais Creek Project".
- Geo/Resource Consultants, Inc., January, 1990. "Sampling and Testing Plan - Islais Creek Project".
- Geo/Resource Consultants, Inc., March, 1990. "Health and Safety Plan - Islais Creek Project".
- Geo/Resource Consultants, Inc., August, 1990. "Final Soil/Groundwater Investigation Report (Phase I)".
- Marshack, Jon B., Updated June 1989 and November 1989, "Designated Level Methodology for Waste Classification and Clean-up Level Determination", Regional Water Quality Control Board, Central Valley Region.
- NUS Analytical Control, 1990, "TCLP Final Regulation Adds 25 Compounds", Volume 15, Number 1.
- Nyer, Evan K., 1985, "Groundwater Treatment Technology", Van Nostrand Reinhold, New York, New York.
- Regional Water Quality Control Board, December, 1986, "Water Quality Control Plan - San Francisco Bay Region (2)".
- Regional Water Quality Control Board, May, 1988, "Leaking Underground Fuel Tank Field Manual".

Regional Water Quality Control Board, October, 1989, "LUFT Field Manual Revision".

San Francisco Department of Public Works, Bureau of Water Pollution Control, "Final Report on Local/General Discharge Limitation Development," September 1990.

San Francisco Department of Public Works, "DPW Regulations - Analyzing Soil for Hazardous Waste Procedure," November 19, 1986

Sedman, Richard M., 1989, "The Development of Applied Action Levels for Soil Contact: A Scenario for the Exposure of Humans to Soil in a Residential Setting", Environmental Health Perspectives, Vol. 79, pp. 291-313.

U.S. Environmental Protection Agency, 1985, "Interim Thresholds for Toxic Gas Generation Reactivity" Office of Solid Waste and Emergency Response.

U.S. Environmental Protection Agency, 1986a, "Quality Criteria for Water, 1986".

U.S. Environmental Protection Agency, June 13, 1986b, Federal Register: ("TCLP").

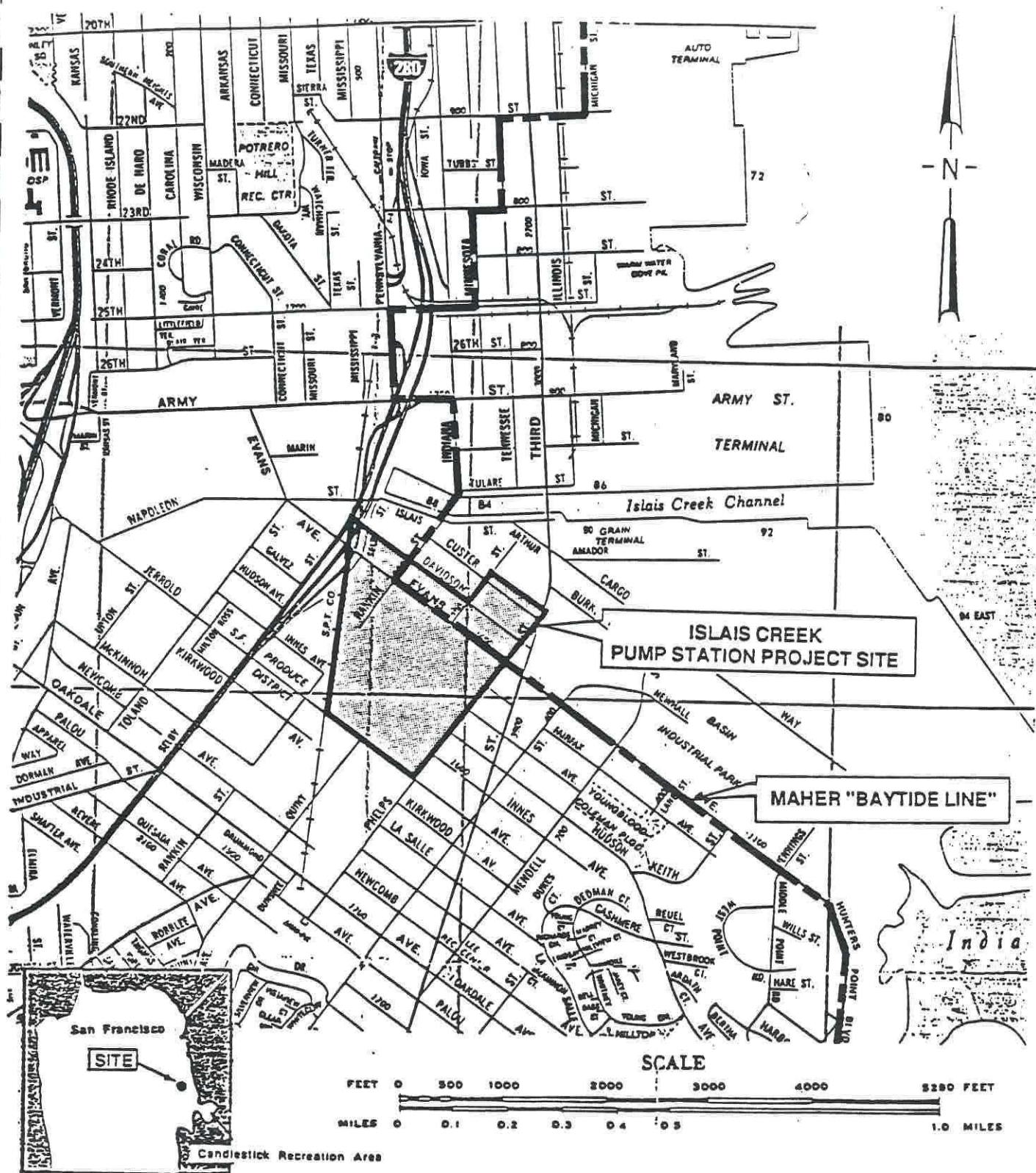
U.S. Environmental Protection Agency, September, 1986c, "RCRA Ground-Water Monitoring Technical Enforcement Guidance Document".

U.S. Environmental Protection Agency, November 18, 1987, "Preparation of a U.S. EPA Region 9 Sample Plan" from Tom Hutteman to Sample Plan Writers and Remedial Project Managers.

Woodward Clyde Consultants, May, 1976, "Geotechnical Investigation for the Proposed Islais Creek South Side Outfalls Consolidation Project, San Francisco, California".

FIGURES

Geo/Resource Consultants, Inc.



Adapted from: California State Automobile Assoc., 1988
Map of the City and County of San Francisco, DPW, 1985



Geo/Resource Consultants, Inc.
GEOLOGISTS / ENGINEERS / ENVIRONMENTAL SCIENTISTS
851 HARRISON STREET, SAN FRANCISCO, CALIFORNIA 94107

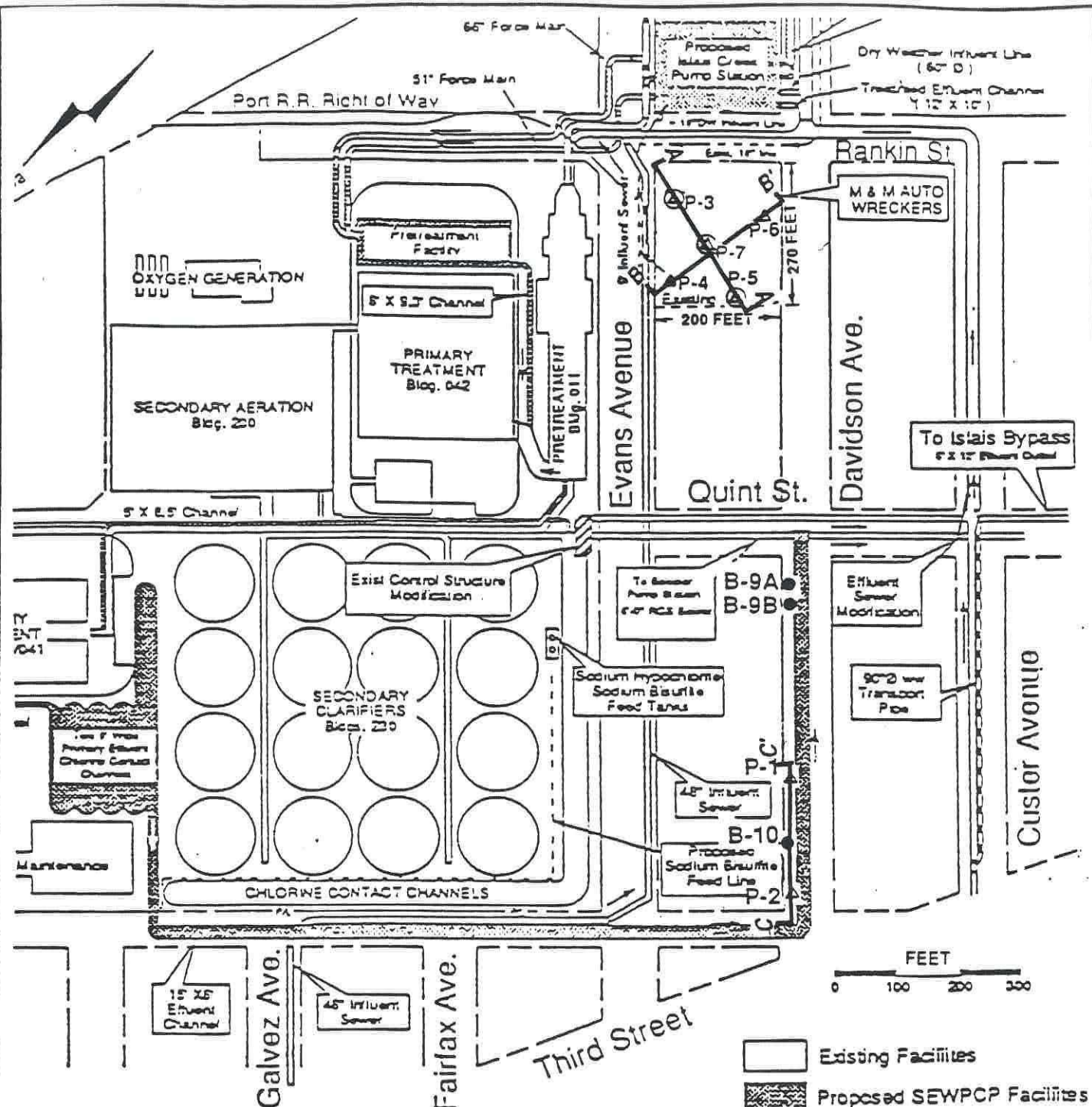
GENERAL VICINITY MAP
ISLAIS CREEK PUMP STATION PROJECT
SOUTHEAST WATER POLLUTION CONTROL PLANT
SAN FRANCISCO, CALIFORNIA

FIGURE

1

Job No. 1514-00-03 Appr. *[Signature]* Date 10/15/90

TAPRINT N4527



B-10 ● Borings drilled during the Islais Creek Pump Station Project, (Phase I, March 1990)

P-1 ▲ Borings drilled during the Islais Creek Pump Station Project (Phase II, September 1990)

F-3 ● HydroPunch Investigations conducted during the Islais Creek Pump Station Project (Phase II, September 1990)

REFERENCE : Map provided by San Francisco Clean Water Program, July 12, 1990

- Existing Facilities
- Proposed SEWPCP Facilities
- Proposed ICPS Facilities
- Proposed WW Transport Pipe
- Cross-Section Lines (See Figure 3)



Geo/Resource Consultants, Inc.
GEOLOGISTS / ENGINEERS / ENVIRONMENTAL SCIENTISTS
851 HARRISON STREET, SAN FRANCISCO, CALIFORNIA 94107

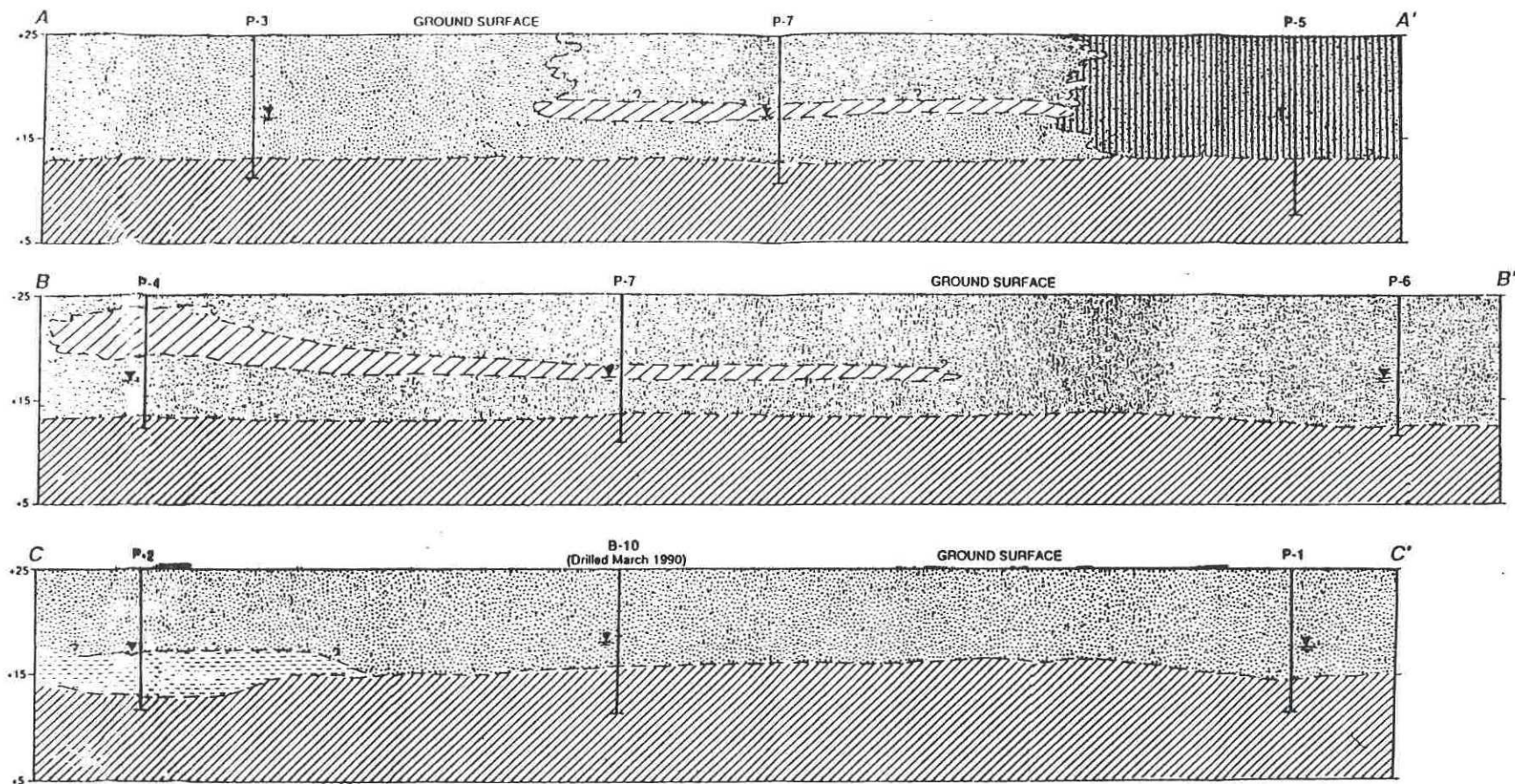
SITE PLAN
ISLAIS CREEK PUMP STATION PROJECT
PHASE II
SOUTH EAST WATER POLLUTION CONTROL PLANT
SAN FRANCISCO, CALIFORNIA

FIGURE

3

Job No. 1514-00-03 Appr. 20 Date 12/6/90

DATAPRINT N45837



LEGEND

ARTIFICIAL FILL

- BROWN SANDY GRAVEL TO GRAVELLY SAND (GW)
- BROWN SILTY GRAVEL TO GRAVELLY SILT (GM)
- BROWN SILTY SAND TO GRAVELLY SAND (SW)

BAY MUD

- OLIVE GRAY CLAY TO CLAYEY SILT (CH)

- BROWN GRAVELLY CLAY (CL)
(CROSS-SECTIONS A-A' AND B-B')

- DARK GRAY CLAY (CL)



WATER LEVEL AT TIME OF DRILLING
ON 9/16/90

SEE FIGURE 3 FOR CROSS-SECTION LOCATIONS

HORIZONTAL : 1 INCH = 20 FEET
VERTICAL : 1 INCH = 10 FEET
VERTICAL EXAGGERATION = 2X



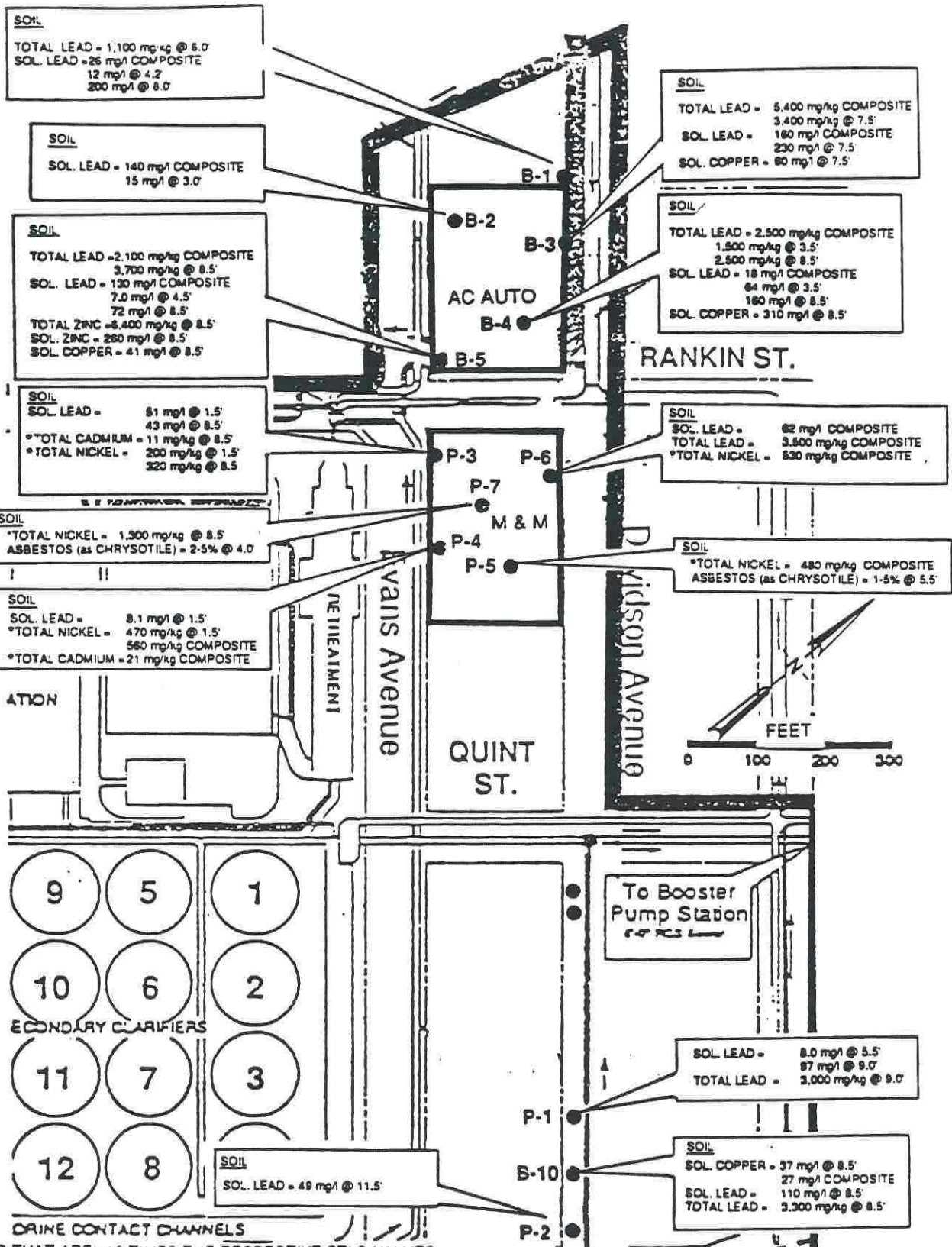
Geo/Resource Consultants, Inc.
GEOLOGISTS / ENGINEERS / ENVIRONMENTAL SCIENTISTS
251 HARRISON STREET, SAN FRANCISCO, CALIFORNIA 94107

Job No. 1514-00-03 Appr. *ea* Date 12/6/90

GEOLOGIC CROSS-SECTIONS
A - A', B - B', AND C - C'
ISLAIS CREEK PUMP STATION PROJECT
SEPTEMBER 1990
SOUTHEAST WATER POLLUTION CONTROL PLANT
SAN FRANCISCO, CALIFORNIA

FIGURE

4



*TTL VALUES THAT ARE >10 TIMES THE RESPECTIVE STLC VALUES

NOTE: B-6, B-7, B-8, B-9a, B-9b, B-11, B-12 and B-13 NOT SHOWN (SEE SECTION 5.1.4)



Geo/Resource Consultants, Inc.
GEOLOGISTS / ENGINEERS / ENVIRONMENTAL SCIENTISTS
851 HARRISON STREET, SAN FRANCISCO, CALIFORNIA 94107

Job No. 1514-00-03 Appr. Date 12/6/90

BORING LOCATIONS
SHOWING FINDINGS ABOVE TTL/STLC VALUES
ISLAIS CREEK PUMP STATION PROJECT
MARCH AND SEPTEMBER 1990
SOUTHEAST WATER POLLUTION CONTROL PLANT
SAN FRANCISCO, CALIFORNIA

FIGURE

5

TABLES

Geo/Resource Consultants, Inc.

TABLE 1
ISLAIS CREEK PUMP STATION
PHASE I - SITE CHARACTERIZATION REPORT
ANALYTICAL TESTING PARAMETERS AND LOCATIONS

SOIL PARAMETERS	EPA METHOD	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	MW1	MW1A	MW1B
Title 26 Metals	6010	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
Cu, Pb, Zn (STLC)	7420	X		X		X					X							
PCBs (Only)	8080	X	X	X		X	X						X	X	X			
pH	9040	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
Flammability	1010				X			X	X	X	X	X	X	X	X			
Cyanides	9010				X			X	X	X	X	X	X	X	X			
Sulfides	9030				X			X	X	X	X	X	X	X	X			
Volatile Organics-GCMS	8240				X	X		X	X	X	X	X						
Semi-Volatile Organics-GCMS	8270				X			X	X	X	X	X						
Aromatic Volatile Organics	8020	X		X			X						X	X	X			
Halogenated Volatile Organics	8010	X		X			X						X	X	X			
TPH-Diesel	8015	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
TPH-Gasoline	8015	X	X	X	X	X	X	X	X	X	X	X	X	X	X			
GROUND WATER	EPA METHOD	B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13	B14	MW1	MW1A	MW1B
Title 26 Metals	6010			X												X	X	X
pH	9045			X												X	X	X
Cyanides	9010			X												X	X	X
Sulfides	9030			X												X	X	X
Volatile Organics-GCMS	624			X												X	X	X
Semi-Volatile Organics-GCMS	625			X												X	X	X
TPH-Diesel	8015			X												X	X	X
TPH-Gasoline	8015			X												X	X	X

TABLE 2A
ISLAIS CREEK PUMP STATION
PHASE I - SITE CHARACTERIZATION REPORT
SOIL ANALYTICAL RESULTS

	EPA METHOD	B1 (4.2', 8.0' Composite)	B2 (3.0', 8.5' Composite)	B3 (4.5', 7.5' Composite)	B4 (3.5', 8.5' Composite)	B5 (4.5', 8.5' Composite)	B6 (4.5', 8.0' Composite)	B7 (3.0', 8.5' Composite)	Laboratory Reporting Limit
Title 26 Metals	6010/7000	See Table 3A and 3B for composited samples							
TTLC and STLC	7000/7428	See Table 4 for discrete samples							
PCBs (mg/kg)	8060	ND	ND	ND	-	ND	ND	-	0.5-1 mg/kg
pH	9040	8.8	7.9	8.6	8.0	8.2	8.8	9.6	0.1
Flammability	1010	-	-	-	>140 F	-	-	>140 F	60-140 F degrees
Cyanides (mg/kg)	9010	-	-	-	ND	-	-	ND	0.1 mg/kg
Sulfides (mg/kg)	9030	-	-	-	ND	-	-	ND	0.1 mg/kg
Volatile Organics	8240	Chemical constituents under EPA 8240 are ND for all samples except for those listed on Table 5.							
Semi-Volatile Organics (mg/kg)	8270	-	ND	-	ND	-	-	ND	1-5 mg/kg
Aromatic Volatile Organics (mg/kg)	8020	ND	-	ND	-	-	ND	-	0.010-0.020 mg/kg
Halogenated Volatile Organics (mg/kg)	8010	ND	-	ND	-	-	ND	-	0.010-0.020 mg/kg
TPH - Gasoline (mg/kg)	8015 modified	ND	ND	ND	ND	ND	ND	ND	1.0 mg/kg
TPH - Diesel (mg/kg)	8015 modified	52	63	ND	ND	230	180	ND	10 mg/kg
HnU ^{***} (mg/kg)		ND, ND, ND	ND, ND, ND	ND, ND, ND	ND, ND, ND	ND, ND, ND	ND, ND, ND	300, 245 200, 160	1 mg/kg

AVAILABLE HAZARDOUS WASTE CLASSIFICATION CRITERIA (SEE SECTION 3.0)

	Title 26 Reactivity Criteria/ EPA Office of Solid Waste and Emergency Response		DHS Hazardous Waste Recommendation for TPH as gasoline	TITLE 26 Corrosivity Criteria	TITLE 26 Ignitability Criteria
	TTLC	STLC			
PCBs	50 mg/kg	5.0 mg/l	cyanide: 250 mg/kg	2 > OR = pH > OR = 12	<140 deg F.
Pentachlorophenol	17 mg/kg		sulfide: 500 mg/kg		
Trichloroethylene	2,040 mg/kg				

Notes: * Sample B9B also referred to as sample B9 in original laboratory data

** HnU measurements listed in order of shallow to deeper depths, see Lithologic Logs for depth of measurements

(-) Dash = not tested

ND = Not Detected at or above indicated Laboratory Reporting Limit.

Original laboratory data supplied by AEL

Laboratory Reporting Limit is a function of sample matrix, dilution factor and analytical instrument sensitivity

TABLE 2B
ISLAIS CREEK PUMP STATION
PHASE I - SITE CHARACTERIZATION REPORT
SOIL ANALYTICAL RESULTS

	EPA METHOD	B6 (4.5', 7.5' Composite)	B9B* (4.5', 9.0' Composite)	B10 (4.5', 8.5' Composite)	B11 (4.5', 8.0' Composite)	B12 (4.5', 8.5' Composite)	B13 (4.0', 8.5' Composite)	B14 (4.5', 8.5' Composite)	Laboratory Reporting Limit
Title 26 Metals	6010	See Table 3A and 3B for composited samples See Table 4 for discrete samples							
PCBs (mg/kg)	8060	-	-	-	-	ND	ND	ND	0.5 mg/kg
pH	9040	8.8	9.2	8.4	8.6	8.4	8.7	9.0	0.1
Flammability	1010	>140 F	>140 F	>140 F	>140 F	>140 F	>140 F	>140 F	60-140 F
Cyanides (mg/kg)	9010	ND	ND	ND	ND	ND	ND	ND	0.1 mg/kg
Sulfides (mg/kg)	9030	ND	ND	ND	ND	ND	ND	ND	0.1 mg/kg
Volatile Organics (mg/kg)	8240	Chemical constituents under EPA 8240 are ND for all samples except for those listed on Table 5.							
Semi-Volatile Organics (mg/kg)	8270	ND	ND	ND	ND	-	-	-	1 - 5 mg/kg
Aromatic Volatile Organics (mg/kg)	8020	-	-	-	-	ND	ND	Toluene - 0.039	0.010-0.020 mg/kg
Halogenated Volatile Organics (mg/kg)	8010	-	-	-	-	ND	ND	ND	0.010-0.020 mg/kg
TPH - Gasoline (mg/kg)	8015 modified	ND	ND	ND	ND	ND	ND	ND	1.0 mg/kg
TPH - Diesel (mg/kg)	8015 modified	16	70	ND	11	ND	18	10	10 mg/kg
HnU** (mg/kg)		84, 125, 110	2, 2	1.2, ND	430, 48, 4	190, 40, 230	ND, ND, ND	2, 4, 10, 19	1 mg/kg

AVAILABLE HAZARDOUS WASTE CLASSIFICATION CRITERIA (SEE SECTION 3.0)

	Title 26 Reactivity Criteria/ EPA Office of Solid Waste and Emergency Response		DHS Hazardous Waste Recommendation for TPH as gasoline	TITLE 26 Corrosivity Criteria	TITLE 26 Ignitability Criteria
	TTLC	STLC			
PCBs	50 mg/kg	5.0 mg/l	cyanide: 250 mg/kg	2 > OR = pH > OR = 12	<140 deg F.
Pentachlorophenol	17 mg/kg		sulfide: 500 mg/kg		
Trichloroethylene	2,040 mg/kg				

Notes: * Sample B9B also referred to as sample B9 in original laboratory data

** HnU measurements listed in order of shallow to deeper depths, see Lithologic Logs for depth of measurements

(-) Dash = not tested

ND = Not Detected at or above indicated Laboratory Reporting Limit.

Original laboratory data supplied by AEL.

Laboratory Reporting Limit is a function of sample matrix, dilution factor and analytical instrument sensitivity

TABLE 3A
ISLAIS CREEK PUMP STATION
PHASE I - SITE CHARACTERIZATION REPORT
SOIL ANALYTICAL RESULTS FOR COMPOSITED SOIL SAMPLES
TITLE 26 METALS (TTLC and STLC)

	B1* 4.2', 8.0' Composite mg/kg (mg/l)	B2* 3.0', 8.5' Composite mg/kg (mg/l)	B3* 4.5', 7.5' Composite mg/kg (mg/l)	B4* 3.5', 8.5' Composite mg/kg (mg/l)	B5* 4.5', 8.5' Composite mg/kg (mg/l)	B6 4.5', 8.0' Composite mg/kg (mg/l)	B7 3.0', 8.5' Composite mg/kg (mg/l)	Laboratory Reporting Limit mg/kg (mg/l)	TTLC mg/kg	STLC (mg/l)
Antimony	ND	ND	ND	ND	ND	ND	ND	25	500	15
Arsenic	0.65	6.9	1.5	8.2	7.2	1.1	1.2	0.50	500	5.0
Barium	80	110	2700 (12)	680	510	110	34	5.00 (0.05)	10000	100
Beryllium	ND	ND	ND	ND	ND	ND	ND	1.00	75	0.75
Cadmium	ND	ND	ND	ND	ND	ND	ND	1.00	100	1.0
Chromium (Total)	35	ND	410	85	120	58	59	5.00	2500	560
Cobalt	5.2	ND	26	9.1	22	12	11	5.00	8000	80
Copper	78	6.9	730 (18)	840 (ND)	280 (10)	190	27	5.00 (0.05)	2500	25
Lead	830 (26)**	530 (140)**	5400** (160)**	2500** (18)**	2100** (130)	100 (3.8)	24	5.00 (0.05)	1000	5.0
Mercury	0.24	0.66	0.42	0.87	0.84	0.23	0.09	0.05	20	0.2
Molybdenum	5.0	8.3	ND	10	ND	14	20	5.00	3500	350
Nickel	26	21	640 (6.6)	120	470 (2.8)	140	45	5.00 (0.05)	2000	20
Selenium	ND	ND	ND	ND	ND	ND	ND	0.50	100	1.0
Silver	ND	ND	ND	ND	ND	ND	ND	5.00	500	5
Thallium	ND	ND	ND	ND	ND	ND	ND	10.00	700	7.0
Vanadium	29	13	20	20	19	42	43	5.00	2400	24
Zinc	240	490	2400 (66)	1500 (ND)	1300 (72)	110	67	5.00 (0.05)	5000	250

Notes: ND = Not Detected at or above indicated Laboratory Reporting Limit

STLC values indicated in parentheses ()

* See Table 4 for TTLC and STLC results for discrete samples

** Bold values exceed TTLC or STLC

Original laboratory data supplied by AEL

Laboratory Reporting Limit is a function of sample matrix, dilution factor and analytical instrument sensitivity

Geo/Resource Consultants, Inc.

TABLE 3B
ISLAIS CREEK PUMP STATION
PHASE I - SITE CHARACTERIZATION REPORT
SOIL ANALYTICAL RESULTS FOR COMPOSITED SOIL SAMPLES
TITLE 26 METALS (TTLC and STLC)

	B8 4.5', 7.5' Composite mg/kg (mg/l)	B9 4.5', 9.0' Composite mg/kg (mg/l)	B10* 4.5', 8.5' Composite mg/kg (mg/l)	B11 4.5', 8.0' Composite mg/kg (mg/l)	B12 4.5', 8.5' Composite mg/kg (mg/l)	B13 4.0', 8.5' Composite mg/kg (mg/l)	B14 4.5', 8.5' Composite mg/kg (mg/l)	Laboratory Reporting Limit mg/kg (mg/l)	TTLC (mg/kg)	STLC (mg/l)
Antimony	ND	ND	ND	ND	ND	ND	ND	25	500	15
Arsenic	1.2	ND	1.9	1.4	ND	ND	ND	0.50	500	5.0
Barium	250	100	820	110	63	110	28	5.00	10000	100
Beryllium	ND	ND	ND	ND	ND	ND	ND	1.00	75	0.75
Cadmium	ND	ND	ND	ND	ND	ND	ND	1.00	100	1.0
Chromium (Total)	38	200	43	86	340	75	46	5.00	2500	560
Cobalt	16	23	16	14	43	22	5.5	5.00	8000	80
Copper	70/85 (3.8)	18	330/240 (27)**	22	14	120	7.5	5.00 (0.05)	2500	25
Lead	120/65 (5.1)**	10	2800/1500** (46)**	ND	14	110/170 (11)**	5.5	5.00 (0.05)	1000	5.0
Mercury	2.4/1.3 (0.0022)	0.51	0.44	0.68	0.15	0.66	0.29	0.05 (0.005)	20	0.2
Molybdenum	14	7.7	21	6.6	ND	30	6.7	5.00	3500	350
Nickel	38	180	36	93	110	61	27	5.00	2000	20.0
Selenium	ND	ND	ND	ND	ND	ND	ND	0.50	100	1.0
Silver	ND	ND	ND	ND	ND	ND	ND	5.00	500	5
Thallium	ND	ND	ND	ND	ND	ND	ND	10.00	700	7.0
Vanadium	32	45	34	22	40	80	30	5.00	2400	24
Zinc	120	48	820	40	52	150	29	5.00	5000	250

Notes: ND = Not Detected at or above indicated Laboratory Reporting Limit

STLC values indicated in parentheses ()

Second metal results obtained from recomposited duplicate samples used to derive some STLC Values

• See Table 4 for TTLC and STLC results for discrete samples

• • Bolded values exceed TTLC or STLC

Original laboratory data supplied by AEL

Laboratory Reporting Limit is a function of sample matrix, dilution factor and analytical instrument sensitivity

TABLE 4A
ISLAIS CREEK PUMP STATION
PHASE I - SITE CHARACTERIZATION REPORT
SOIL ANALYTICAL RESULTS FOR DISCRETE SAMPLES
TITLE 26 METALS (TTLC AND STLC)

	B1 4.2' mg/kg (mg/l)	B1 8.0' mg/kg (mg/l)	B2 3.0' mg/kg (mg/l)	B2 8.5' mg/kg (mg/l)	B3 4.5' mg/kg (mg/l)	B3 7.5' mg/kg (mg/l)	Laboratory Reporting Limit mg/kg (mg/l)	TTLC mg/kg	STLC mg/l
Copper	(-) (-)	(-) (-)	9.5 (0.53)	130 (4.9)	23 (0.48)	1200 (60)*	5 (0.05)	2500	25
Lead	110 (12)*	1100* (200)*	200 (15)*	140 (1.8)	48 (2.3)	3400* (230)*	5 (0.05)	1000	5
Zinc	(-) (-)	(-) (-)	58 (3.2)	320 (6.2)	52 (1.3)	2400 (160)	5 (0.05)	5000	250

Notes: STLC values indicated in parentheses ()

* Bolded values exceed TTLC or STLC

Original laboratory data supplied by AEL

(-) Dash = not tested

Laboratory Reporting Limit is a function of sample matrix, dilution factor and analytical instrument sensitivity

TABLE 4B
ISLAIS CREEK PUMP STATION
PHASE I - SITE CHARACTERIZATION REPORT
SOIL ANALYTICAL RESULTS FOR DISCRETE SAMPLES
TITLE 26 METALS (TTLC AND STLC)

	B4 3.5' mg/kg (mg/l)	B4 8.5' mg/kg (mg/l)	B5 8.5' mg/kg (mg/l)	B10 4.5' mg/kg (mg/l)	B10 8.5' mg/kg (mg/l)	Laboratory Reporting Limit mg/kg (mg/l)	TTLC mg/kg	STLC mg/l
Copper	50 (3.1)	1100 (310)*	900 (41)*	51 (0.88)	600 (37)*	5 (0.05)	2500	25
Lead	1500* (64)*	2500* (160)*	3700* (72)*	21 (0.51)	3300* (110)*	5 (0.05)	1000	5
Zinc	220 (12)	2300 (80)	6400* (260)*	120 (3.2)	2200 (80)	5 (0.05)	5000	250

Notes: STLC values indicated in parentheses ()

- * Bolded values exceed TTLC or STLC
- Original laboratory data supplied by AEL
- (-) Dash = not tested

Laboratory Reporting Limit is a function of sample matrix, dilution factor and analytical instrument sensitivity

TABLE 5
ISLAIS CREEK PUMP STATION
PHASE I - SITE CHARACTERIZATION REPORT
SOIL ANALYTICAL RESULTS
VOLATILE ORGANICS EPA METHOD 8240

	B2 3.0', 8.5' Composite (mg/kg)	B4 3.5', 8.5' Composite (mg/kg)	B5 4.5', 8.5' Composite (mg/kg)	B7 3.0', 8.5' Composite (mg/kg)	B9B* 4.5', 9.0' Composite (mg/kg)	B10 4.5', 8.5' Composite (mg/kg)	Laboratory Reporting Limit (mg/kg)
Acetone	0.120	ND	ND	0.110	ND	ND	0.1
Chloroform	ND	ND	0.006	ND	ND	ND	0.005
Methylene Chloride	0.054	0.007	0.093	ND	0.011	0.011	0.005
Toluene	0.006	ND	0.014	ND	ND	ND	0.005

Notes: Original laboratory data supplied by AEL

ND = Not detected at or above indicated Laboratory Reporting Limit

*Sample B9B also referred to as sample B9 in original laboratory data

Laboratory Reporting Limit is a function of sample matrix, dilution factor and analytical instrument sensitivity

TABLE 6
ISLAIS CREEK PUMP STATION
PHASE I - SITE CHARACTERIZATION REPORT
GROUND WATER ANALYTICAL RESULTS

	EPA METHOD	B3	MW1	MW1A (MWI Duplicate)	MW1B (Field Blank)	Laboratory Reporting Limit (mg/l)
Title 26 Metals (mg/l)	6010/7000	See Table 7 for all samples				
pH	150.1	7.0	7.0	7.0	6.0	0.1
Cyanides (mg/l)	335	ND	ND	ND	ND	0.1
Sulfides (mg/l)	376	ND	ND	ND	ND	0.1
Volatile Organics (mg/l)	624	ND	ND	ND	ND	0.005-0.1
Semi-Volatile Organics (mg/l)	625	ND	ND	ND	ND	0.010-0.050
TPH - Gasoline (mg/l)	8015 (modified)	ND	ND	ND	ND	0.05
TPH - Diesel (mg/l)	8015 (modified)	ND	ND	ND	ND	0.2

Notes: Original laboratory data supplied by AEL

ND = Not Detected at or above indicated Laboratory Reporting Limit

N/A = Not Applicable.

Laboratory Reporting Limit is a function of sample matrix, dilution factor and analytical instrument sensitivity.

TABLE 7
ISLAIS CREEK PUMP STATION
PHASE I - SITE CHARACTERIZATION REPORT
GROUND WATER ANALYTICAL RESULTS
TITLE 26 METALS EPA METHOD 6010/7000

	B3 (mg/l)	MW1 (mg/l)	MW1A (MW1 Duplicate) (mg/l)	MW1B (Field Blank) (mg/l)	Laboratory Reporting Limit (mg/l)	1990 San Francisco Local Sewer Discharge Limits (mg/l)
Antimony	ND	ND	ND	ND	0.50	NA
Arsenic	0.009	0.025	0.012	ND	0.005	5.0
Barium	0.51	0.48	0.80	ND	0.05	NA
Beryllium	ND	ND	ND	ND	0.01	NA
Cadmium	ND	ND	ND	ND	0.01	0.5
Chromium (Total)	0.29	0.09	0.42	ND	0.05	5.0
Cobalt	0.06	ND	0.10	ND	0.05	NA
Copper	1.9	ND	0.09	ND	0.05	5.0
Lead	3.3*	0.05	0.09	ND	0.05	3.0
Mercury	0.0024	0.0015	ND	ND	0.0005	0.05
Molybdenum	ND	ND	ND	ND	0.05	NA
Nickel	0.32	0.06	0.36	ND	0.05	2.0
Selenium	ND	ND	ND	ND	0.005	NA
Silver	ND	ND	ND	ND	0.05	1.0
Thallium	ND	ND	ND	ND	1.00	NA
Vanadium	0.18	0.07	0.31	ND	0.05	NA
Zinc	3.2	0.09	0.35	ND	0.05	7.0

Notes: ND = Indicates Not Detected at or above indicated detection limits
Original laboratory data supplied by AEL
NA= Not Available
* Bold values meet or exceed the listed regulatory limits or guidelines.

Laboratory Reporting Limit is a function of sample matrix, dilution factor and analytical instrument sensi

TABLE 8
ISLAIS CREEK PUMP STATION
PHASE II - SITE CHARACTERIZATION REPORT
ANALYTICAL TESTING PARAMETERS AND LOCATIONS

SOIL PARAMETERS	EPA METHOD	P-1			P-2			P-3		P-4		P-5			P-6		P-7		
		5.5'	9.0'	13.0'	6.0'	8.5'	11.5'	1.5'	8.5'	1.5'	8.5'	1.5'	5.5'	Composite 0.5', 12.0'	1.5'	Composite 10.5', 13.0'	3.5'	4.0'	8.5'
Title 26 Metals	6010							X	X	X	X	X		X	X	X	X		X
Lead (TTL.C)	7420	X	X	X	X	X	X												
Lead (STL.C)	WET	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X		X
Copper (TTL.C)	7210	X	X	X	X	X	X												
Copper (STL.C)	WET	X	X	X	X	X	X	X	X	X	X	X		X	X	X	X		X
Polychlorinated Biphenyls	8080							X		X		X			X		X		
Acidity (pH)	9040							X	X	X	X	X		X	X	X	X		X
Flammability	1010							X	X	X	X	X		X	X	X	X		X
Cyanides	9010							X	X	X	X	X		X	X	X	X		X
Sulfides	9030							X	X	X	X	X		X	X	X	X		X
Halogenated Volatile Organics	8010							X	X	X	X	X		X	X	X	X		X
Aromatic Volatile Organics	8020							X	X	X	X	X		X	X	X	X		X
TPH-I-Diesel	8015 modified					X	X	X	X	X	X	X		X	X	X	X		X
TPH-Gas	8015 modified							X	X	X	X	X		X	X	X	X		X
Oil and Grease	9071							X		X		X		X	X		X		
Asbestos	600/M4-82-020												X					X	
GROUNDWATER PARAMETERS	EPA METHOD							P-3W					P-5W					P-7W	
Title 26 Metals	6010							X					X					X	
Purgeable Halocarbons	601							X					X					X	
Purgeable Aromatics	602							X					X					X	
TPH-I-Diesel	8015 modified							X					X					X	
TPH-Gas	8015 modified							X					X					X	
Conductivity	9050							X					X					X	
Chlorides	9252							X					X					X	
Salinity	2520							X					X					X	

TABLE 9A
ISLAIS CREEK PUMP STATION
PHASE II - SITE CHARACTERIZATION REPORT
SOIL ANALYTICAL RESULTS

CONSTITUENTS	EPA METHOD	P-1 3.5' (discrete)	P-1 9.5' (discrete)	P-1 13.5' (discrete)	P-2 6.5' (discrete)	P-2 8.5' (discrete)	P-2 11.5' (discrete)	P-3 1.5' Boring and HydroPunch (discrete)	P-3 8.5' Boring and HydroPunch (discrete)	Laboratory Reporting Limit
Title 26 Metals, TTLC	6010/7000	-	-	-	-	-	-	See Tables 10-11	See Tables 10-11	5.0 mg/kg-0.2 mg/l
Lead, TTLC and STLC	7420	See Table 11	See Table 11	See Table 11	See Table 11	See Table 11	See Table 11	See Table 11 (STLC only)	See Table 11 (STLC only)	5.0 mg/kg-0.2 mg/l
Copper, TTLC and STLC	7420	See Table 11	See Table 11	See Table 11	See Table 11	See Table 11	See Table 11	See Table 11 (STLC only)	See Table 11 (STLC only)	0.05-25 mg/l
Aromatic Volatile Organics (mg/kg)	8020	-	-	-	-	-	-	See Table 12	See Table 12	0.005-0.010 mg/kg
Halogenated Volatile Organics (mg/kg)	8010	-	-	-	-	-	-	ND	ND	0.005-0.010 mg/kg
Total Oil and Grease (mg/kg)	9071	-	-	-	-	-	-	29,000	-	50 mg/kg
PCBs (mg/kg)	8080	-	-	-	-	-	-	0.3	-	0.010 mg/kg
Acidity (pH)	9040	-	-	-	-	-	-	8.9	9.0	0.1
Flammability (degrees F)	1010	-	-	-	-	-	-	>140 deg. F	>140 deg. F	63-140 deg. F
Cyanides (mg/kg)	9010	-	-	-	-	-	-	ND	ND	1.0 mg/kg
Sulfides (mg/kg)	9030	-	-	-	-	-	-	2.6	ND	1.0 mg/kg
TPH - Gasoline (mg/kg)	8015 modified	-	-	-	-	-	-	ND	ND	1.0 mg/kg
TPH - Diesel (mg/kg)	8015 modified	-	-	-	-	680	200	8,500	15,000	10 mg/kg
Asbestos, as (%) Chrysotile	600M 482020	-	-	-	-	-	-	-	-	1%
HnU* (ppm)		2	ND	18	-	5	ND	-	-	N/A

AVAILABLE HAZARDOUS WASTE CLASSIFICATION CRITERIA (SEE SECTION 3.0)

	Title 26 Reactivity Criteria/ EPA Office of Solid Waste and Emergency Response		DHS Hazardous Waste Recommendation for TPH as gasoline	TITLE 26 CORROSIVITY CRITERIA	TITLE 26 IGNITABILITY CRITERIA
PCBs	TTLC 50 mg/kg	STLC 5.0 mg/l	cyanide: 250 mg/kg	>OR=pH>OR=12	<140 deg F.
Polychlorophenol	17 mg/kg		sulfide: 500 mg/kg		
Trichloroethylene	2,040 mg/kg				

Notes: * HnU measurements listed in order of shallow to deeper depths, see Lithologic Logs for depth of measurements
 (-) Dash = not tested
 ND = Not Detected at or above indicated Laboratory Reporting Limit.
 Original laboratory data supplied by AEL.

Laboratory Reporting Limit is a function of sample matrix, dilution factor and analytical instrument sensitivity.

TABLE 9B
ISLAIS CREEK PUMP STATION
PHASE II - SITE CHARACTERIZATION REPORT
SOIL ANALYTICAL RESULTS

CONSTITUENTS	EPA METHOD	P-4 1.5' (discrete)	P-4 8.5', 13.0' (composite)	P-5 1.5' Boring and HydroPunch (discrete)	P-5 8.5' Boring and HydroPunch (discrete)	P-5 8.5', 12.0' Boring and HydroPunch (composite)	P-6 1.5' (discrete)	P-6 10.5', 13.0' (composite)	P-7 3.5' Boring and HydroPunch (discrete)	P-7 4.0' Boring and HydroPunch (discrete)	P-7 8.5' Boring and HydroPunch (discrete)	Laboratory Reporting Limit
Title 26 Metals, TTLC (mg/kg)	6010/7000	See Table 10	See Table 10	See Table 10	-	See Table 10	See Table 10	See Table 10	See Table 10	-	See Table 10	0.05-25 mg/kg
Lead, STLC only (mg/l)	7210	See Table 11	See Table 11	See Table 11	-	See Table 11	See Table 11	See Table 11	See Table 11	-	See Table 11	8.2 mg/l
Copper, STLC only (mg/l)	7420	See Table 11	See Table 11	See Table 11	-	See Table 11	See Table 11	See Table 11	See Table 11	-	See Table 11	8.2 mg/l
Aromatic Volatile Organics (mg/kg)	8020	ND	ND	ND	-	ND	See Table 12	See Table 12	ND	-	ND	0.005-0.010 mg/kg
Halogenated Volatile Organics (mg/kg)	8010	ND	ND	ND	-	ND	ND	ND	ND	-	ND	0.005-0.010 mg/kg
Total Oil and Grease (mg/kg)	9071	120	-	880	-	-	880	-	70	-	-	80 mg/kg
PCBs (mg/kg)	8080	0.09	-	0.045	-	-	ND	-	ND	-	-	0.010 (mg/kg)
Acidity (pH)	9040	8.2	8.7	8.9	-	8.9	6.9	7.7	8.1	-	9.2	0.1
Flammability (degrees F)	1010	>140 deg. F	>140 deg. F	>140 deg. F	-	>140 deg. F	>140 deg. F	>140 deg. F	>140 deg. F	-	>140 deg. F	65-140 deg. F
Cyanides (mg/kg)	9010	ND	ND	ND	-	ND	ND	ND	ND	-	ND	1.0 mg/kg
Sulfides (mg/kg)	9030	ND	1.0	ND	-	ND	ND	1.8	1.0	-	ND	1.0 mg/kg
TPH - Gasoline (mg/kg)	8015 modified	ND	ND	ND	-	ND	21	4.5	ND	-	ND	1.0 mg/kg
TPH - Diesel (mg/kg)	8015 modified	100	48	140	-	ND	53	100	30	-	23	10 mg/kg
Asbestos, as (%) Chrysotile	600M 482020	-	-	-	1 - 5	-	-	-	-	2 - 5	-	1%
HnU* (ppm)		-	8	-	-	12	ND	ND	-	ND	ND	N/A

AVAILABLE HAZARDOUS WASTE CLASSIFICATION CRITERIA (SEE SECTION 3.0)

	TTLC	STLC	Title 26 Reactivity Criteria/ EPA Office of Solid Waste and Emergency Response	DHS Hazardous Waste Recommendation for TPH as gasoline	TITLE 26 CORROSIVITY CRITERIA	TITLE 26 IGNITABILITY CRITERIA
PCBs	50 mg/kg	5.0 mg/l	cyanide: 250 mg/kg	1,000 mg/kg	2>OR=pH>OR=12	<140 deg F.
Pentachlorophenol	17 mg/kg		sulfide: 500 mg/kg			
Trichloroethylene	2,040 mg/kg					

Notes: * HnU measurements listed in order of shallow to deeper depths, see Lithologic Logs for depth of measurements
 (-) Dash = not tested
 ND = Not Detected at or above indicated Laboratory Reporting Limit.
 Original laboratory data supplied by AEL

Laboratory Reporting Limit is a function of sample matrix, dilution factor and analytical instrument sensitivity.

TABLE 10
ISLAIS CREEK PUMP STATION
PHASE II - SITE CHARACTERIZATION REPORT
SOIL ANALYTICAL RESULTS
EPA METHOD 6010/7000 - TITLE 26 METALS, TTLC

Metals (mg/kg)	P-3 1.5'	P-3 8.5'	P-4 1.5'	P-4 8.5', 13.0' (composite)	P-5 1.5'	P-5 8.5', 12.0' (composite)	P-6 1.5'	P-6 10.5', 13.0' (composite)	P-7 3.5'	P-7 8.5'	Laboratory Reporting Limit (mg/kg)	TTLC (mg/kg)	STLC (mg/l)
Antimony	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	25	500	15
Arsenic	8.9	8.1	1.6	1.0	2.1	ND	2.6	4.3	0.5	ND	5.0	500	5.0
Barium	120	150	82	36	470	22	750	810	65	50	5.0	10,000	100
Beryllium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.0	75	0.75
Cadmium	6.3	11**	ND	21**	ND	ND	2.0	4.9	2.0	2.1	1.0	100	1.0
Chromium (Total)	110	150	280	270	26	260	25	160	580	610	5.0	2,500	560
Cobalt	18	20	32	30	15	24	20	19	57	48	5.0	8,000	80
Copper	210	260	57	29	130	23	120	360	14	26	5.0	2,500	25
Lead	610	770	52	21	34	8.6	12	3500**	5.6	14	5.0	1,000	5.0
Mercury	0.11	0.15	0.95	ND	0.46	ND	ND	0.73	ND	ND	0.05	20	0.2
Molybdenum	15	13	14	24	19	25	21	ND	ND	ND	5.0	3,500	350
Nickel	200**	320**	470**	560**	43	490**	40	530**	69	1300**	5.0	2,000	20
Selenium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.5	100	1.0
Silver	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	5.0	500	5
Thallium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	700	7.0
Vanadium	38	33	38	45	27	40	23	20	28	46	5.0	2,100	24
Zinc	360	360	90	52	66	44	61	1,500	38	69	5.0	5,000	250

Notes: ND = Not Detected at or above Indicated Laboratory Reporting Limit

Original laboratory data supplied by AEL

* Values in milligrams per kilogram (mg/kg) unless otherwise noted

** Values exceed TTLC, or are > or = 10 x STLC

Laboratory Reporting Limit is a function of sample matrix, dilution factor and analytical instrument sensitivity

TABLE 11A
ISLAIS CREEK PUMP STATION
PHASE II - SITE CHARACTERIZATION REPORT
SOIL ANALYTICAL RESULTS FOR DISCRETE SAMPLES
COPPER AND LEAD (TTLC (mg/kg) and STLC (mg/l))

	P-1 (75' Northwest of B-10)			B-10 (Drilled during Phase I)		P-2 (65' South of B-10)				
	5.5'	9.0'	13.0'	4.5'	8.5'	6.0'	8.5'	11.5'	Laboratory Reporting Limit mg/kg (mg/l)	TTLC (STLC)
Copper	230 (1.6)	270 (19)	47 (ND)	51 (0.88)	600 (37)*	36 (ND)	38 (ND)	23 (ND)	5.0 (0.2)	2500 mg/kg (25) mg/l
Lead	250 (8.0)*	3000* (97)*	79 (2.3)	21 (0.51)	3300* (110)*	49 (0.64)	62 (1.2)	71 (49)*	5.0 (0.2)	1000 mg/kg (5) mg/l

Notes: STLC values indicated in parentheses (L)

* Bolded values exceed TTLC or STLC

Original laboratory data supplied by AEL

(-) Dash = not tested

Laboratory Reporting Limit is a function of sample matrix, dilution factor and analytical instrument sensitivity

TABLE 11B
ISLAIS CREEK PUMP STATION
PHASE II - SITE CHARACTERIZATION REPORT
SOIL ANALYTICAL RESULTS FOR DISCRETE SAMPLES
COPPER AND LEAD (TTLC (mg/kg) and STLC (mg/l))

	P-3		P-4		P-5		P-6		P-7			
	1.5'	8.5'	1.5'	Composite 8.5', 13.0'	1.5'	Composite 8.5', 12.0'	1.5'	Composite 10.5', 13.0'	3.5'	8.5'	Laboratory Reporting Limit mg/kg (mg/l)	TTLC (STLC)
Copper	210 (3.9)	260 (5.2)	57 (5.2)	29 (0.76)	130 (2.1)	23 (0.4)	120 (3.9)	360 (8.2)	14 (0.4)	26 (0.97)	5.0 (0.2)	2500 mg/kg (25) mg/l
Lead	610 (51)*	770 (43)*	52 (8.1)*	21 (0.99)	34 (1.3)	8.6 (0.50)	12 (0.70)	3500** (62)	5.6 (0.51)	14 (0.82)	5.0 (0.2)	1000 mg/kg (5) mg/l

Notes: STLC values indicated in parentheses (L)

* Bolded values exceed TTLC or STLC
Original laboratory data supplied by AEL
(-) Dash = not tested

Laboratory Reporting Limit is a function of sample matrix, dilution factor and analytical instrument sensitivity

TABLE 12
ISLAIS CREEK PUMP STATION
PHASE II - SITE CHARACTERIZATION REPORT
SOIL ANALYTICAL RESULTS*
EPA METHOD 8020 - AROMATIC VOLATILE ORGANICS

Aromatic Volatile Organics	P-3 1.5'	P-3 8.5'	P-6 1.5'	P-6 10.5' 13.0' (Composite)	Laboratory Reporting Limit (mg/kg)
Benzene	ND	ND	ND	ND	0.005
Chlorobenzene	ND	ND	ND	ND	0.005
1,2-Dichlorobenzene	ND	ND	ND	ND	0.005
1,3-Dichlorobenzene	ND	ND	ND	ND	0.005
1,4-Dichlorobenzene	ND	ND	ND	ND	0.005
Ethylbenzene	ND	ND	ND	ND	0.005
Toluene	0.008	0.011	ND	ND	0.005
Xylenes (Dimethylbenzenes)	0.021	0.028	0.12	0.027	0.010

Notes: ND = Not Detected at or above indicated Laboratory Reporting Limit
Original laboratory data supplied by AEL
* Values in milligrams per kilogram (mg/kg) unless otherwise noted

TABLE 13
ISLAIS CREEK PUMP STATION
PHASE II - SITE CHARACTERIZATION REPORT
GROUND WATER ANALYTICAL RESULTS

CONSTITUENTS	EPA METHOD	P-3W	P-5W	P-7W	Laboratory Reporting Limit
Title 26 Metals, TTLC (mg/l)	6010/7000	See Table 14	See Table 14	See Table 14	0.004-4.0 mg/l
Aromatic Volatile Organics (mg/l)	602	ND	ND	ND	0.0005-0.001 mg/l
Halogenated Volatile Organics (mg/l)	601	ND	ND	ND	0.0005-0.001 mg/l
TPH - Gasoline (mg/l)	8015 modified	ND	ND	ND	0.05 mg/l
TPH - Diesel (mg/l)	8015 modified	ND	ND	ND	0.2 mg/l
Chlorides (mg/l)	9252	5,400	2,200	4,500	1.0 mg/l
Salinity (mg/kg)	2520	9,700	4,000	8,100	0-40,000 mg/kg
Specific Conductance (µmhos/cm)	9050	25,000	9,800	11,000	1.0 µmhos/cm

Notes: (-) Dash = not analyzed

ND = Not Detected at or above indicated Laboratory Reporting Limit.

N/A = Not Applicable

Original laboratory data supplied by AEL

Laboratory Reporting Limit is a function of sample matrix, dilution fact analytical instrument sensitivity.

TABLE 14
ISLAIS CREEK PUMP STATION
PHASE II - SITE CHARACTERIZATION REPORT
GROUND WATER ANALYTICAL RESULTS*
EPA METHOD 6010/7000 - TITLE 26 METALS, TTLC

Metal	P-3W (Unfiltered)	P-5W (Filtered)	P-7W (Unfiltered)	Laboratory Reporting Limit (mg/l)	1990 San Francisco BWPC Discharge Limits (mg/l)
Antimony	ND	ND	ND	4.0	NA
Arsenic	ND	ND	0.06	0.02	5.0
Barium	1.6	ND	6.3	0.2	NA
Beryllium	ND	ND	ND	0.04	NA
Cadmium	ND	ND	ND	0.04	0.5
Chromium (Total)	ND	ND	0.28	0.2	5.0
Cobalt	ND	ND	ND	0.2	NA
Copper	0.73	ND	3.8	0.2	5.0
Lead	3.2**	0.25	10**	0.2	3.0
Mercury	ND	ND	0.017	0.004	0.05
Molybdenum	ND	ND	ND	0.2	NA
Nickel	0.39	ND	0.33	0.2	2.0
Selenium	ND	ND	ND	0.02	NA
Silver	ND	ND	ND	0.2	1.0
Thallium	ND	ND	ND	4.0	NA
Vanadium	ND	ND	ND	0.2	NA
Zinc	2.2	0.20	8.0**	0.2	7.0

Notes: ND = Not Detected at or above indicated Laboratory Reporting Limit
Original laboratory data supplied in Appendix by AEL
NA = Not Available

* Values in milligrams per liter (mg/l) unless otherwise noted

** Bolded values meet or exceed listed regulatory limits or guidelines